Incorporating Principles of Motor Learning in Therapy for SSD with Speech Motor Chaining

Dr. Jonathan Preston, Dr. Nina Benway, & Megan C. Leece

Thursday, December 5, 2024
10:00AM - 11:00AM
CC/Arch-3AB (or Virtual platform)

ABSTRACT

This session will explain Speech Motor Chaining, a therapy method designed for children with ongoing speech sound disorders (SSD) and those with speech difficulties related to childhood apraxia of speech. We'll go over how the therapy works, including the structure of a typical session and the tools used to apply key principles of motor learning. We'll also discuss who this approach is best suited for and share findings from recent studies on how effective it is.

LEARNING OUTCOMES

At the conclusion of this session, participants will be able to:

- List four principles of motor learning
- Describe how Speech Motor Chaining alters speech practice conditions
- Describe how Speech Motor Chaining alters elements of feedback

SPEECH MOTOR CHAINING

Speech Motor Chaining (SMC) is a therapy method based on motor learning principles. It helps children acquire and generalize sounds by adjusting practice levels, feedback, and difficulty to maintain the "just right" challenge. Learners start with a core syllable and gradually expand linguistic level using forward or backward chaining. Prosodic variability is also added. As linguistic levels increase, rate and specificity of feedback are reduced.

AT A GLANCE

TAKEAWAYS

- SMC uses an adaptive framework to move efficiently through practice hierarchies
- SMC constantly adjusts practice and feedback levels to ensure a "just right" practice level
- SMC promotes generalization with prosodic variability and by encouraging self-monitoring

BENEFITS

- Multiple studies show that Speech Motor Chaining is an effective way to incorporate principles of motor learning into SSD treatment
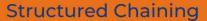
SPEECH PRODUCTION LAB

Dr. Jonathan Preston, Director

For more information:
https://speechproductionlab.syr.edu

TREATMENT ELEMENTS

Prepractice

Each Speech Motor Chaining session begins with prepractice, aimed first at achieving stimulability for the core syllables. As stimulability improves, the focus shifts to reviewing strategies for correct production. This phase uses familiar techniques like shaping, verbal cues, gestures, and metaphors to establish correct syllables. Prepractice concludes when a set criterion (2-3 correct syllables each) is met, or when the session ends.

Structured Chaining

If prepractice criteria is achieved during the session, the session progresses to structured chaining practice. During the structured chaining phase, targets are elicited in blocks of six. Linguistic level adapts based on the learner's performance. Built-in cues for prosodic variation are provided. The system prompts opportunities for client self-evaluation (prior to SLP giving feedback). Feedback rate and type are prompted by the system. Within each chain, learners progress until the level of the chain becomes too difficult (accuracy less than 5/6). When starting a new chain, always start the chain at the syllable level.

Random Practice

Once your learner is consistently making progress in structured practice (suggested: reaching mutisyllabic word level for at least two chains), the SMC website will add random practice to your session. Random practice targets are the highest level of each chain reached with 5/6 accuracy. Your learner might be working with a combination of syllables, words, phrase,, and sentences. Targets are presented randomly with only delayed, Knowledge of Resutls feedback given on half the items. Targets can also be presented with prosodic variation. Each target is only presented once (though once the set is complete, they can be presented again if time allows).

EARLY TREATMENT SESSIONS
- *Goal = Motor Acquisition*
- Prepractice may take the entirety of sessions if your learner is not readily stimulable for the sound.
- You may not reach structured chaining practice in early sessions (or may reach it for brief intervals)
- It may not be appropriate to do random practice

LATER TREATMENT SESSIONS
- *Goal = Motor Learning*
- As client becomes more stimulable, prepractice may be very brief resulting in more time spent in structured chaining
- Random practice becomes a more significant part of the session as learner is more accurate

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Learn more at :
Open Science Framework
https://osf.io/5jmf9/
(open access)

LINKS

Speech Motor Chaining Website

https://chaining.syr.edu

Currently free for SLPs to use in treatment. Please use pseudonyms for clients/students to avoid PHI being saved to SU servers.

Speech Motor Chaining Tutorial Article

Preston, J. L., Leece, M. C. & Storto, J. (2019). Tutorial: Speech motor chaining treatment for school-age children with speech sound disorders. Language, Speech & Hearing Services in Schools, 50(3), 343-355.

Start your Speech Motor Chaining journey here! Along with the artice, check out the supplemental material accompanying the publication, including a fillable Excel datasheet and videos demonstrating Speech Motor Chaining treatment

Selected Publications with SMC

- Preston, J. L.,Caballero, N. F., Leece, M. C., Wang, D., Herbst, B., & Benway, N. R. (2023). A randomized controlled trial of treatment distribution and biofeedback effects on speech production in school-aged children with apraxia of speech.Journal of Speech, Language & Hearing Research, 67(9S), 3414-3436.
- Preston, J. L., Leece, M. C., McNamara, K., & Maas, E. (2017). Variable practice to enhance speech learning in ultrasound biofeedback treatment for childhood apraxia of speech: A single case experimental study. American Journal of Speech-Language Pathology, 26(3), 840-852.
- Preston, J. L., & Leece, M. C. (2017). Intensive treatment for persisting rhotic distortions: A case series. American Journal of Speech-Language Pathology, 26(4), 1066-1079.
- Preston, J. L., Leece, M. C., & Maas, E. (2016). Intensive treatment with ultrasound visual feedback for speech sound errors in childhood apraxia. Frontiers in Human Neuroscience, 10, 440.

SMC WEBSITE HIGHLIGHTS

- Moves through the principles of motor learning framework seamlessly, keeping the SLP's attention on the client
- Allows for customization of session parameters in a motor learning framework
- Provides session-to-session data and accuracy information that can be copy/pasted into a chart note
- Progress monitoring module allows you to repeat administration of a probe list multiple times to assess generalization and retention

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